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A comparison of the spectrograms of α *Herculis* and Barnard's star shows general agreement of spectral class, but discordances in the relative intensities of several absorption lines. We note the following differences:

Line	In α *Herculis*	In Barnard's star
4227 Ca	very strong	much weaker
4435 Ca	strong	stronger
4455 Ca	strong	much stronger
4535 Ti	strong	stronger
4395	fairly strong	apparently weaker
4404	fairly strong	apparently weaker

The differences described are apparently the indications, according to Adam's discovery, that α *Herculis* is a "giant" star at a great distance from us and Barnard's star a "dwarf" comparatively near us. A 20-hour exposure on the spectrum of Barnard's star, using a 16-inch camera in combination with the 60° prism, would probably permit a valuable estimate of the parallax of the star to be made, by the Adams method; but unfortunately the requirements of our other programs prevented the devotion of twenty hours to this purpose.

Assuming that the B. D. star +4°.3560, which follows Barnard's star by 9 seconds of time, has visual magnitude 8.7, the visual magnitude of Barnard's star must be approximately 10½. Taking the color index of stars of spectral class Mb to be 2, the photographic magnitude of Barnard's star is therefore about 12½.

W. W. CAMPBELL,
J. H. MOORE.

PRELIMINARY REPORT ON THE DETERMINATION OF THE LONGITUDE OF THE STUDENTS' OBSERVATORY BY WIRELESS SIGNALS FROM ARLINGTON.

In the spring of 1914, while Washington and Paris were conducting their longitude campaign by exchange of wireless signals between Arlington and the Eiffel Tower, an attempt was made to determine the difference in longitude between the Students' Observatory at Berkeley and the U. S. Naval Observatory at Washington by intercepting the Arlington signals.

No signals could be heard until the top of the Sather Campanile (for which the steel frame was just then completed) was used for one support of the receiving aerial. After the aerial had been strung from the Mechanics Building to the top of the Campanile the Arlington signals could be received. However, the regular Paris-Arlington signals came along about 4 P. M., at which time there was so much wireless business being done on the Pacific Coast that these signals could not be detected with certainty. Recourse had then to be had to the 10 P. M. Arlington signals (7 P. M. P. S. T.). These signals were observed on several nights, but only those were used which came on nights when accurate observations for local sidereal time were obtained with the new Bamberg Transit and the registering micrometer, so that we did not have to trust to the rate of the chronometer which was somewhat irregular. Six such sets of observations are available.

The Washington local mean time of sending these signals has been kindly furnished by Captain J. A. Hoogewerff, U. S. N., Superintendent of the U. S. Naval Observatory.

The results of these six nights' observations are exhibited in the following table:

Date 1914	U. S. Naval Obsty. Local Mean Time Sending	Students' Obsty. Local Mean Time Receiving	Diff. of long **Wash'n-Berkeley**	**Wt.**
Feb. 21	$9^h\ 51^m\ 44^s.21$	$6^h\ 50^m\ 57^s.17$	$3^h\ 00^m\ 47^s.04$	3.0
27	44 .23	57 .16	47 .11	3.7
Mar. 3	44 .21	57 .17	47 .04	3.7
6	44 .28	57 .30	46 .98	2.6
15	44 .27	57 .16	47 .11	4.2
Apr. 19	44 .41	57 .34	47 .07	2.6

Weighted mean . . . $3^h\ 00^m\ 47^s.06 \pm 0^s.03$

The weights assigned have been computed as the square root of the product of the number of coincidences observed in receiving the signals by the number of stars used in the local time determination of the night.

The Washington-Greenwich longitude used is $5^h\ 8^m\ 15^s.78$. Using this and the value of Washington-Berkeley just found, we have for the longitude of the Students' Observatory, Berkeley, referred to Greenwich, $8^h\ 9^m\ 2^s.84$.

Using the value of the longitude of Washington found from the Washington-Paris work, *viz:* $5^h\ 8^m\ 15^s.72$, we would have $8^h\ 9^m\ 2^s.78$ as the longitude of Berkeley. Captain

Hoogewerff writes that the latter value of the longitude of Washington has not yet been adopted for use.

Captain Hoogewerff writes further that times of sending the 10 P. M. signals cannot be connected up with the Washington-Paris work very rigorously "on account of the different relay lags involved, that at Radio sometimes amount to about $0^s.01$."

The value $8^h\ 9^m\ 2^s.84$ agrees very well with that used here for several years past (*viz:* $8^h\ 9^m\ 2^s.82$) which was determined by connecting up with the U. S. Coast and Geodetic Survey Observatory in San Francisco.

Because of the uncertainty, mentioned by the Superintendent of the U. S. Naval Observatory, due to the possible relay lags, the value of the longitude of the Students' Orservatory heretofore used, *viz:* $8^h\ 9^m\ 2^s.82$, will be continued as the adopted mean value until further notice.

In this campaign the radio work was ably conducted by Messrs. R. B. Abbott of the Department of Physics, and H. F. Fisher and F. E. Pernot of the Department of Mechanical Engineering. The local time determinations were made by Messrs. R. T. Crawford, S. Einarsson, and S. B. Nicholson of the Berkeley Astronomical Department. The whole campaign was directed by Professor A. O. Leuschner, Director of the Students' Observatory.

R. T. CRAWFORD.

Berkeley Astronomical Department,
July 28, 1916.

ON THE ORBIT OF (132) AETHRA.

The minor planet *Aethra* was discovered by Watson in 1873. Watson observed it on six nights, and Borrelly, Coggia and Stephan of the Marseilles Observatory on seventeen consecutive nights until the fifth of July. Since then it has not been seen.

Widely differing orbits were published by Watson and later by Luther. The values of the mean daily motion for these range from 843″ to 980″. Luther's work included the computation of the orbit upon several assumptions of the mean motion. He computed ephemerides for several consecutive years and some search was made on the basis of them, but the results were negative.